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ANIMAL
KINGDOM
Bulletin of the
New York
Zoological Society
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We Owe It to Wildlife

THERE ARE INCREASING NUMBERS OF REPORTS that many species
Tof the great mammals of Africa are having a hard time of it
owing to enroachment on their reserves by rapidly increasing
human populations and by the ever-wider use of firearms. The

other day I received a letter from Dr. Victor Van Straelen, President of the Institute of the National Parks of the Belgian Congo, which reads in part: "My life is an endless battle for the maintenance of the national parks, always under the menace of the lumbermen, the meat-dealers and the prospective cattle-breeders. When the natives look at white people, covering thousands of miles in order to shoot at animals ... we lose in a few days the benefit of years of preaching and teaching."

Our Society has a very vital interest in wildlife protection both in our own country and in other parts of the world. Why shouldn't we? In one sense we have no right to exhibit animals in our Zoological Park unless we at the same time do something to protect them in their native habitats. This year we will complete two studies on the situation of some of our own precious wildlife, namely, the Rocky Mountain sheep and some of the lesser fauna of the Western Plains. Now we are in the midst of formulating two projects which will provide us with first-hand information on the status of wildlife in certain regions of Africa. Conservationists are winning some pretty good battles here at home right now. We have the feeling that our institution must do its share in helping to preserve wildlife in other parts of the world. After all, in the long years ahead our remarkable collections of animals from all over the world could not be maintained unless the animals exist in numbers in their own countries. Anyway, quite irrespective of this, wild animals also have a right to live.

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Fairfield Oston

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Draco, the gliding lizard, is in full "flight." Its extensible ribs, joined by a flap of skin, may readily be seen as it sails downward and outward. The long tail is used for balancing.
By LIFE Photographer Peter Stackpole. Time, Inc.
"Flying"
REPTILES

By M. W. F. TWEEDIE
Director, Raffles Museum, Singapore
Introduction by
WILLIAM BEEBE

N AUGUST SECOND while I was shaving in my bungalow in the Goodwood Park in Singapore, a lizard glided through the open window of the bathroom and landed with a plop close beside me. This was the first leg of the flying lizard's trip of twelve thousand miles, half around the world, on the wings of a Pan American plane instead of its own; a flight which ended in the reptile house of our own Bronx Zoo. Here it found a warm welcome, for it appears to be the first of the species in our collection.

So tightly were its skinny "wings" furled that even when I picked it up I had no idea of its identity. It was in process of shedding and draped with streamers of dangling skin. Not until I had unravelled the small reptile and seemed to be pulling its entire body apart did I realize I was holding the peeled off skin replica of one of the spread "wings." Through the cellophane transparency of the epidermis was visible the bril liant red spots and the bands of the actual flap.

Several days later I idly watched the shadow of a leaf, flicking back and forth on a palm trunk in

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Draco at rest. When not gliding, it folds the flaps of skin alongside the body, out of the way as it walks or runs. Total length, 11 in. Photos by author unless otherwise credited.

the Botanical Gardens. My glasses resolved this into another lizard with its crimson and yellow throat pouch, jerking back and forth. It soon seemed to fall asleep with eyes closed until a fly buzzed near, when the Draco crept slowly along, futilely stalking the insect. Next a wasp hovered overhead, one of the wicked, steel-blue giants, and the lizard rose on all four feet, half spread its flaps and lashed about with its tail. There seemed a distinct element of uneasiness, if not actual fear. Finally the creature crawled slowly upward and disappeared into the vegetation at the base of the lowermost frond.

One of the last of my lizard-watchings proved the most dramatic. Again a Draco flickered its parti-colored wattle in the Singapore Botanical Gardens, but this time on a very slender, sloping

palm, overhanging the bushes at the edge of the forest. I saw all that happened from a grandstand seat near the orchid house.

A half-grown macaque monkey from a band nearby saw the lizard as soon as I did, and began to hitch up the sloping trunk. Draco watched the approach, and just before the little fingers could close over its body, it spread sail and leaped out into space in a graceful are which ended ten feet
up the next palm. It then looked up and

flickered in what we humans would call derision. The inexperienced young macaque found the smooth bole difficult to descend, and a few feet down he slipped and fell. For some distance his feet and limbs worked frantically, and, catlike, he seemed actually slightly to orient himself. Before he landed unharmed on the fringing row of bushes he was fully spread-eagled. Had he fallen to the ground he most surely would have been killed or severely injured.

While I was in Singapore I asked Mr. M. W. F. Tweedie, Director of the Raffles Museum, to write a short account of the gliding reptiles as he has been acquainted with them for many years, and was instrumental in sending the shipment of living lizards to our Zoo. His article follows.

M
OST NATURALISTS are familiar with the appearance of the "flying" squirrels and with their capacity for gliding from one tree to another, and so for traversing large areas of forested country without descending to the ground. Quite a number of mammals possess this limited power of flight, such as the flying squirrels and the so-called flying lemur. All of them are adapted for gliding in the same way, by the development of a web of skin between the fore and hind limbs which, when the limbs are fully stretched out, acts as a parachute to support the animal in the air. In the equatorial rain forests of Southeast Asia several kinds of arboreal reptiles are also endowed with this power of gliding, but the nature of the adaptations whereby they achieve it are curiously diverse and make an interesting study. During my association with the Raffles Museum I have had the opportunity of seeing most of the Malayan species of these gliding reptiles in life and some of them in actual flight.

Most highly modified, probably most efficient
and surely the most attractive of all of them are
the wonderful little lizards of the genus Draco,
the "Flying Dragons" of the older textbooks.
These have the hinder five, six or seven pairs

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THE FAR SIDE, 1982. Universal Press Syndicate. Reprinted with permission All rights reserved.
NATURE
The larger-than-life
lizard
eckos are familiar to
most people as the
sticky-footed
little
lizards that lurk behind the lights
in buildings in warmer climes.
Apart from their distinctive
shape and ability to walk up walls
and windows, one feature that
the many species in the family
Gekkonidae have in common is
their small size. Thus, in July
1984, an Iranian medical orderly
made herpetological history
when he came across a gecko
measuring 40cm in length.
Mohamed Reza Ensaf made
his discovery in Khuzistan, the
troubled border region near
Iraq. and was subsequently
immortalised by having the
species, Eublepharis ensafi.
named after him. It was believed
to be the largest gecko on earth
(beating the former contender.
the 30cm tokay, by a third)-but
it was about to be dwarfed by a
zoological mystery.
The ink was scarcely dry on the
above description when a cen-
tury-old, stuffed lizard moved
into the limelight.
Alain
Delcourt, curator of the Marse-
ille Natural History Museum in
France, sent some photographs
of this puzzling specimen to
George Zug, herpetologist at
Smithsonian
the

Institution,
"You Imbecilel
Giant gecko Hoplodactylus delcourti, resurrected for the record books.
Washington DC, for possible identification. He in turn forwarded the data to Aaron Bauer, of the University of Berkeley. California, and Anthony Russell, of the University of Calgary, Canada, who described the animal as a new species of gecko. and named it Hoplodactylus delcourti in honour of the Marseilles museum curator.
For a gecko, this species is truly monstrous-62cm (more than two feet) in length-twice as long as a tokay, and three times the length of the former
We flew 12,000 miles for THIS?"
largest species of Hoplodactylus. Its colour is a yellowish-brown with dark, reddish-brown longitudinal dorsal stripes-evidently a spectacular creature when alive-but no details of the specimen's origin are known today. It was probably brought to the Marseille Museum sometime during the years 1833 to 1869-a period for which the archives have been lost-and it is astonishing to think that visitors to the museum have been shown the stuffed enigma for a century and a half without realising its zoological significance!
The genus Hoplodactylus is endemic to New Zealand; is it possible that a giant stripy gecko could have eluded antipodean naturalists for more than two centuries? And did the Maoris know of the species? Although the largest known reptile in New Zealand is the tuatara, which reaches only 60cm, Maori tribesmen told James Cook in 1777 of eight foot (two and a half metre)

lizards that "sometimes seize and devour men".

Similar tales of huge saurians called taniwha have been recorded by other explorers, and it has been suggested that they may refer to either saltwater crocodiles or monitor lizards- neither of which have been recorded by science in New Zealand. But these are clearly not referring to geckos.

There are, however, other reports which do fit the bill. In the Transactions of the New Zealand Institute of 1871, Sir Walter Buller wrote about the lizards of New Zealand, including a mysterious one: "The Kawekaweau, a beautiful striped lizard, sometimes attaining a length of two feet, is still undescribed. It was formerly abundant in the forests north of Auckland, and is still occasionally met with. Mr F E Maning, of Hokianga, recently obtained possession of a pair of live ones, but unfortunately for science, one of them was devoured by a cat and the other made its escape.

In 1873, a Major W G Mair wrote in the same journal of the similar sounding kawekau, which a Maori chief had killed under loose bark. The chief described it as being "about two foot long, and as thick as a man's wrist; colour brown, striped longitudinally with dull red." These descriptions both match closely the Marseille museum specimen, and the reported behaviour (hidden under bark) is consistent with the known daytime retreats of other large geckos. Bauer and Russell have thus proposed that Hoplodactylus delcourti and the kawekau (alias kawekaweau) of the Maoris are one and the same species.

Another mysterious reptile

which may be a gecko, but which doesn't fit with the above reports, is the ngarara, of which there are descriptions of at least two varieties: one is larger and lived in burrows on the plains, the other was smaller and lived in streams. A report in the Auckland Weekly News of 11 April 1956 described a creature that may have been an aquatic ngarara. And it does not seem beyond the bounds of possibility that a nocturnal forest gecko-even a giant stripy one-might have eluded the attentions of collectors in some remote corner of New Zealand. Anyone visiting that part of the world who notices such a creature stomping out from behind the wall light should contact their nearest natural history museum immediately!

MICHEL RAYNAL
BBC WILDLIFE JANUARY 1988
Museum d'Histoire Naturelle de Marseille. France

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inform individuals of the presence of another member of their species.

The "flying dragons" belong to the family Agamidae. The only other lizards which are adapted in this way belong to the genus Ptychozoon, members of a totally different group, the geckos. Of the two Malayan species of gliding geckos Kuhl's Flying Gecko, Ptychozoon kuhli, is the more common. Its gliding mechanism, when compared with that of Draco, affords an interesting example of how the same object can be achieved in two quite different ways. On each flank of the gecko there is an outgrowth of rather thick skin, stiffened with fibrous tissue, strongly near the line of union with the body, distally progressively less so. It is not under any sort of muscular control and, when not in use, lies curled side of the head is a smaller outgrowth of skin similarly disposed. The tail has a scalloped fringe of skin on each side, permanently extended, and the fingers and toes are broadly webbed.

When Ptychozoon takes to the air it starts with

a sort of swallow dive. As it accelerates the pressure of the air on its underside forces open the two flaps of skin so that they project on each side. The degree and distribution of their stiffening is such that, under the falling lizard's weight, the air pressure and their own natural tendency to downward curvature are balanced when they lie in the horizontal plane of the body. These, together with the flaps on the head, the outstretched webbed feet and the frilled tail, enable the lizard to glide at an angle a little flatter than 45 degrees. It is a larger, more heavily built ani-
round the body, the two flaps not quite meeting in the mid-ventral line. From below it looks a little as if the lizard were wearing a waistcoat, fitted in its younger and slimmer days and no longer susceptible of being buttoned up. On each

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These two eggs of the Flying Gecko were deposited on bark, on top of the remains of previously-laid eggs. Color and pattern make the Flying Gecko hard to see on bark. This one has regenerated the end of its tail.

mal than Draco, and its total speed of air-resisting surface, although so diversely constituted, is considerably less, relative to its weight. It is, accordingly, much less buoyant in the air.

The eggs are most curious. They are always

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of ribs extending, in the form of cartilaginous rods, outside the body, and supporting a membrane of skin. The ribs are horizontally hinged at their bases and the whole apparatus can be folded up like a fan and laid along the sides, when it is scarcely visible and no encumbrance to the lizard when it is running or climbing.

As rule the parachute is only spread when the lizard takes to the air, but occasionally it is half opened when two lizards are courting, chas ing or sparring with each other. When it is closed and the animal stands motionless on a tree trunk the color of the body blends perfectly with the bark.

In flight these little reptiles are graceful and buoyant and glide at quite a small angle from the horizontal. The "wings" are brightly colored. those of the common Draco volans being blue

The Flying Gecko is considerably larger and

more heavily built than Draco, and consequently less buoyant, gliding at an angle of about 45 degrees. This baby is six days old. below in the male and orange with darker markings above. The first one I saw in flight I quite genuinely mistook for a butterfly and was most startled when it landed on a tree and was transformed to a drab, skinny little lizard.

All of them possess a scaly pouch on the throat with a smaller "wattle" on each side of it. Rods of cartilage (branches of the hyoid bone) project into these and the pouch can be flicked backwards and forwards. In most of the species it is brightly colored, yellow or red, and so is very conspicuous and its movement often betrays the presence of a lizard which one would not otherwise have noticed. Both sexes have the pouch, but it is larger and brighter in males. It is certainly used in courtship, but unaccompanied lizards can often be seen displaying it, and I think it also serves the purpose of a signaling device to

A sub-adult Flying Gecko, photographed on a sheet of glass, reveals flaps of skin coiled around the sides. These are spread outward by air pressure as the reptile begins its glide.

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laid in pairs and have the form of hemispheres glued by their flat sides to the bark of a tree. Unlike Draco, therefore, which deposits its eggs in mould at the base of a tree, Ptychozoon need never come down to the ground. The pair of illustrated, which was found on a tree under a mass of epiphytic orchids, shows an additional interesting feature. It can be clearly seen that one of them partly overlies a circle of shell representing another egg, which has hatched and of which only the adherent part remains. This circle overlies, in turn, yet another. I take this as an indication that the female returns repeatedly to the same place to lay her eggs. This suggests that she spends long periods, perhaps her whole life. in a restricted territory, possibly in some cases in a single large tree, for the interval between laying and hatching of the eggs is a long one, about ten weeks.

Both the young and adult gecko are colored and patterned for concealment against a background of bark, but in the young the tail ends in a conspicuous black and white "flag." When the liz-

ard is stalking its prey this is twitched from side to side. The possibility exists that this is an adapta-

The so-called Flying Snake is a handsome reptile of green and black with a row of four-petalled red spots along the back. It is not as efficient a glider as many of the lizards.

tion to direct the attention of a predator to this "expendable" part of the gecko's anatomy at times when it is likely to betray its whereabouts by movement. The adult photographed on bark has at some time lost its tail, but has grown a new one.

A number of species of arboreal colubrid snakes have a curious modification of the ventral scales - those scales, that is, which lie across the belly, each one overlapping the one behind it. Normally these are entire and (in the colubrids and most other snakes) span the under surface from side to side. The modification consists of a ridge on each side, a little short of the lateral end of the scale and traversing it at right angles, parallel, that is to say, with the axis of the snake's body. These ridges are, in fact, hinges at which the scales can be sharply flexed. Collectively they form two lines, one running along each side of the belly surface, between which the belly can be drawn inwards, so that the body becomes hemicylindrical, like half a split bamboo.

One of the genera modified in this way is Chrysopelea, and on several occasions these beautiful snakes have been observed sailing through the air from the branches of a high tree. I have never been so fortunate as to witness this performance, but the English naturalist, R. Shelford, experimented with Chrysopelea in Sarawak and his observations make it clear that the snake achieves buoyancy by drawing in its belly and so trapping a cushion of air, just as a parachute traps air under the inverted bowl of its envelope.

Several other genera, Ahaetulla, Dryophiops and Gonyophis, have the ventral scales modified in the same way. All are arboreal snakes and I believe that they will all eventually be found to be gliders.

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Zoo Picto
Photographs by

Twelve years ago our Education Department began what has turned out to be an enormously popular service to schools in the New York area - sending a staff member to classrooms with a miscellaneous collection of small animals. In an average year our school traveller gives some 400 talks and shows the animals to 35,000 to 40,000 school children, and requests for her visits far exceed her capacity to travel from school to school in the course of a day. We know, by enthusiastic letters from teachers and children, that interest in animals and in the countries from which our travelling collection comes, rises sharply after a visit to the classroom. Miss MARION MCCRANE (left) is our current school traveller. One of her star performers is TINKER, a gentle Kinkajou from tropical America. Tinker generally sleeps in his travelling case on the way to school, and on being taken out he stretches, yawns, and gives such a graphic demonstration of complete relaxation that the children sometimes imitate him. SNOOPY, the Coati-mundi (also of tropical America), is another great favorite because of his extreme liveliness and activity. Recently, in periods between schools, Miss McCrane has been rehearsing Snoopy in a tightrope-walking act. He doesn't, actually, need much rehearsing, for he loves to climb and jump-witness the picture at the right, where Snoopy is making one of his flying leaps from a bookcase to the shoulder of the Education Department's secretary. Other animals in our school collection are a Skunk, a small Boa Constrictor, Great Horned Owl, two Sparrow Hawks, an Opossum and a Silky rooster.

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BRETT ROBERTSON/VUW
Was the kawekaweau the
world's largest gecko?
****
A common New Zealand green gedes Nadiamus elegans is dwarfed by the unique speamen of Hoplodactylus delcourt
Is this largest of all geckos the animal the Maon called kapekampeau?
A unique specimen of a gecko,
discovered languishing in the
basement of a French museum, may
be the only tangible evidence of the
large forest lizard called kawekaweau
in Maori folklore. TONY
WHITAKER looks at what is
known of the kawekaweau and
recent efforts to confirm that the
specimen of Hoplodactylus
delcourti, the world's largest gecko,
came from New Zealand.

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W
HEN PAKEHA
arrived in New Zea-
land Maori told them
of large lizards-
known as
kawekaweau (some-
times kaweau or
koeau) which inhabited the dense for-
ests of the North Island. Kawekaweau
were usually described as about 60 cm
long and arboreal, and were distinguished
from a similar-sized reptile, the tuatara.
Some accounts describe them as ground-
dwelling or amphibious, and it was even
suggested they could fly. They reputedly
ate the berries of forest trees such as tawa.
Although some early pakeha settlers
are believed to have seen kawekaweau,
there are no known specimens or precise
descriptions. In fact, the best account,
from 1870, was also the last. Gilbert Mair
described how a Urewera chief had killed
'a kawekaweau found beneath the bark of
BIRD / MAY
1992
a rata tree in the Waimana Valley, near
Whakatane. This animal was said to be
"about two feet [60 cm] long, and as
thick as a man's wrist; colour brown,
striped longitudinally with dull red".
the
By the middle of this century
absence of any further sightings, and the
complete lack of material to support the
existence of a lizard of half a metre or
longer, meant the biological reality of the
kawekaweau was in doubt. It seemed that
either the animal was mythical, like the
taniwha and kumi, or perhaps based on
grossly exaggerated accounts of a much
of lizard.
smaller species
Then in 1979 Alain Delcourt, curator
at the Museum d'Histoire Naturelle de
Marseille in France, found a study skin of
a huge gecko among a collection of
mounted reptiles stored in the museum's
basement. Unfortunately, there was no
information with the specimen or in the
museum registers of where, when or by

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whom it had been collected. And although it had been in the museum since at least 1902 there was no indication of when it arrived.

Realising immediately the significance of his find - at 62 cm it was half as long again as the previously largest known gecko, Rhacodactylus leachianus of New Caledonia - Delcourt sent photographs of the specimen to various herpetologists hoping for identification. Finally Aaron Bauer and Tony Russell in the United States, specialists in gecko taxonomy, concluded from the external form and X-rays of its skeleton that the large gecko at Marseille was probably a species of Hoplodactylus, a genus until then found only in New Zealand.

In 1986 Bauer and Russell formally named the Marseille gecko Hoplodactylus delcourti, honouring Alain Delcourt. Since then, H. delcourti has generally been regarded as part of the New Zealand fauna and has been closely linked with the kawekaweau of Maori folklore. However, doubts and questions remain about its genealogy and about how and when it got to Marseille.

ROM THE BEGINNING of the colonial period Marseille was the French base for many voyages to this part of the world and most material returning from here would have passed through that port.

apparent

The huge gecko may have been obtained by the museum between 1833 and 1869, a period for which all museum records have been lost, or it may have formed part of the founding collection when the museum was established in 1819. Another possibility is that it was acquired by the original director, during a visit to India and the Far East in 1819.

An argument often used by those sceptical of the close link between the Marseille gecko and the kawekaweau, is the

absence of skeletal material

of a large gecko amongst the relatively well documented sub-fossil faunal remains from New Zealand caves and dunes. Bones of tuatara and many of the larger species of lizards now extinct on the mainland occur at widely distributed sites, yet bones large enough to be from H. delcourti had never been recognised. However, two bones collected in central Otago in the 1870s could be from a gecko of this dimension. One was a reptile jaw bone, similar in size to that from a large tuatara (60 cm) but, instead of being serrations of the jaw itself, the teeth were separate as in lizards. The other was a small curved bone believed at the time to be the rib of a kumi - a large reptile in Maori folklore. The jaw bone can no longer be found but the "rib" is still in the Canterbury Museum. Re-assessment of this "rib" indicates it is probably a cloacal bone - paired bones occurring in the genitalia of male geckos - which its length (14 mm) suggests came from a gecko about 60 cm long.

A S PART OF the sesquicentennial celebrations in 1990 the National Museum of New Zealand mounted a special exhibition, The Forgotten Fauna, focussing on the remarkable New Zealand herpetofauna. After protracted negotiations with the Museum d'Histoire Naturelle de Marseille and the French government, approval was gained to bring Hoplodactylus delcourti to New Zealand as the exhibition's centrepiece. The specimen was on display for two months before a multi-disciplinary research effort was mounted to try and work out its age and origin. This research had the makings of a real detective story.

The specimen of H. delcourti is what zoologists call a "study skin". Rather than being preserved as a pickled specimen the animal has been stuffed, but instead of being mounted in a natural posture it is out straight and with its limbs extended. X-rays of the specimen show the skull is intact and the lin bs are present but the

vertebral column and ribs are gone. The skin has been tanned and it has had artificial eyes fitted.
the
Researchers were not allowed to open specimen so they had to be content with what could be gleaned from the outside or from X-rays.
First to check out the specimen were National Museum taxidermist Noel Hyde, and Rose Evans and Valerie Carson of the museum's Conservation Unit. In their opinion the animal had clearly been prepared by a trained taxidermist.
From his knowledge of the history of taxidermy Noel believes the mount was prepared early in the 19th century. Earlier taxidermy techniques on small animals involved leaving their skeletons more or less intact to frame up the mount. Later techniques used elaborate wire or wood frameworks for the same purpose (X-rays show there is no wire or wood in this specimen), and usually involved the removal of most of the skull and all limb bones except for the toes. The artificial eyes lack the detail of the realistic glass eyes that became common-place in taxidermy by the middle of last century. The thread is 2-ply linen that would have been widely available through the 19th century.
The shape of the H. delcourti specimen and the scales on the head and feet are remarkably similar to those of the other geckos in New Zealand and the main reasons for its placement in the endemic New Zealand genus Hoplodactylus.
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BRUCE THOMAS

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BRUCE THOMAS
KAWEKAWEAU■
The material used to stuff zoological specimens can often indicate their origin. This was examined in the hope that the big gecko might contain plant fibre peculiar to New Zealand such as flax. Instead, the stuffing almost certainly contains sisal,

a fibre commonly used in taxidermy last century.

An expert on the New Zealand geckos, Rod Hitchmough at Victoria who studies plant pollen), Dallas Mildenhall. If the pollen adhering to the specimen turned out to be predominantly of New Zealand plant species it would show that if not actually collected here the animal had, at the very least, been in this country at some time in the past.

No luck. The pollen Dallas was able to collect from the skin surface and the stuffing proved to be all from European plants - Maybe somewhere amongst the Pape Reischek or Aubin there is more detail on what these animals were.

The negotiations to borrow the H. delcourti specimen, and its subsequent arrival and display, created widespread publicity and the National Museum received a number of fresh reports of very large lizards. Most of the sightings seemed to involve unwitting exaggeration of size or misidentification but a few, particularly one near Gisborne, could not be explained away so easily.

There are several, albeit remote, possibilities. Perhaps one of the bigger lizard species that were formerly widespread on the mainland (.g. Duvaucel's gecko Hoplodactylus duvaucelii or robust skink Cyclodina alani) or the tuatara still survives on the East Coast or maybe tuatara from offshore islands have been released in the area. Maybe a large species of lizard from Australia has been liberated there. Or, just perhaps, the kawekaweau still lingers on

The colour and colour pattern of the only specimen of Hoplodactylus delcourti closely match Mair's 1873 description of the kawekaweau - colour brown striped longitudinally with dull red".

University, re-assessed the external form of the gecko, counting and measuring scales and checking body proportions. He confirmed Bauer and Russell's placement of the big gecko in Hoplodactylus.

X-rays of the specimen were able to provide sufficient detail of the skull and

limb bones to also show that its placement in Hoplodactylus is probably correct on the basis of its bone structure. The H. delcourti specimen is a male and fortunately one of its cloacal bones is still in position, adhering to the inside of the skin at the base of the tail. The X-ray images are remarkably similar in shape to the kumi "rib" in Canterbury Museum and it is virtually identical in size.

Next came Victoria University parasitologist Ruth Ainsworth who thoroughly examined the whole exterior surface of the H. delcourti specimen in the hope of finding New Zealand parasitic mites still adhering to it. Unfortunately this was not to be.

After the parasitologist came the geneticist. Laboratory techniques with DNA now allow genetic "finger-printing" to identify the relationships between species or even between individuals. Geoff Chambers, from Victoria University, hoped that minute tissue samples scraped from the inside surface of the skin would show how H. delcourti is related to other geckos and prove it is correctly placed in the New Zealand genus Hoplodactylus. Sadly however, the samples yielded no DNA, perhaps because of the tanning process used on the skin.

The final effort to prove a New Zealand for H. delcourti involved DSIR's forensic palynologist (a person

origin

mostly pines, spruces and hops. Although nothing was discovered that would tie the Marseille specimen to a New Zealand origin, neither was anything found that is inconsistent with it having come from here. The most likely scenario - common to many zoological specimens taken to Europe from New Zealand is that the gecko went to Europe pickled in alcohol and was later prepared as a study skin by a professional taxidermist.

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HERE TO FROM HERE?

Because the Museum

d'Histoire Naturelle de Marseille made it quite clear that the loan of H. delcourti was an exception to their general policy, the New Zealand research was carefully recorded on film, X-rays and transparencies. Because the most convincing proof of a huge gecko in the New Zealand fauna will probably come from the discovery of skeletal remains in cave or dune deposits, the X-rays of the specimen will be used to prepare a reference atlas for palaeontologists working on sub-fossil fauna.

Closer to home there might be leads in some lost papers of Frederick Manning or Gilbert Mair both of whom supposedly saw or held specimens of kawekaweau.

And finally there is the mysterious story of Jean Aubin and Andreas Reischek. In 1882 when Reischek was in the King Country searching for Maori artifacts he left his cases of specimens reputedly containing some very large stuffed lizards in the care of Jean Aubin, storekeeper at the border town now known as Pirongia.

1992

in some remote corner of the country.

If it can eventually be proven that the specimen of Hoplodactylus delcourti is indeed from New Zealand, it is almost certainly the animal the Maori people "about two feet long, and thick as a man's wrist "}

was how Gilbert Mair described a kawekaweau killed near Whakatane about 1870.

Hoplodactylus delcourti in Wellington in early 1990 for display and research.

knew as kawekaweau. Sadly, the lack of confirmed sightings since the 1870s suggest the kawekaweau is now extinct and must join the long list of species that have succumbed to habitat destruction and the impact of introduced predators since humans arrived in this country.

Tony Whitaker is one of New Zealand's foremost herpetologists. Formerly with DSIR he now works as a freelance ecologist specialising in lizards.

BRETT ROBERTSON/VUW